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ABSTRACT

This review of the impact of the microelectronic revolution on the Canadian telephone industry focuses on the prospect of dwindling job security for telephone workers. Technical advances that are cited as having reduced the industry's job market include the dial telephone, direct distance dialing, directory assistance computerization, and interactive television directories. Also discussed at length are the effects of two computer operated switchboard systems, Traffic Operator Position Systems (TOPS) and Traffic Service Position System (TSPS), as well as the effects of electronic switching, digital technology, and the attachment of subscriber provided terminal equipment to the telephone network. The paper concludes with the warning that any further introduction of technological innovations must be well-planned or else industrial chaos and turmoil among Canadian organized labor will result. (AEA)

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The Electronic Working Environment
by Boris Mather
Federal Chair
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Boris Mather

The outline for this conference session has announced that we will "examine some of the changes in working conditions brought about by technological developments" and that we would "consider the new factors brought into the working environment".

WHERE HAVE ALL THE WORKERS GONE?

As a trade unionist representing communications workers, my first reaction is to say, "What working environment? The biggest change for many telephone workers is no available work at all".

That is the first challenge to workers in our industry brought by technological change(s) through computerization. The great fear among telecommunications workers is the fear of unemployment. Some students of the problem insist that it is really fear of a loss of income and status, rather than actual loss of the job that worries workers.

Fortunately the impact of the microelectronics revolution on work has been addressed by several bodies. The Science Council of Canada has done studies and held workshops; the Delta Group is continuing its studies, the Department of Communications has become involved and the federal Department of Labour is sponsoring a conference next month on this subject. The Canadian Labour Congress will be holding a conference for

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trade-unionists: the Ontario Federation of Labour has already done so. On the international scene, the International Labour Organization and the Postal, Telephone and Telegraph International have had conferences on the introduction of technology in our industry. We are all familiar with the Nora Report commissioned by the French Government. A notable book on the subject is the "The Collapse of Work", an English work by Clive Jenkins and Barry Sherman.

THE COMET KEEPS COMING

Unfortunately many of these conferences, and perhaps this conference will be the same, are rather like assemblies of astronomers exchanging information about an impending comet. While they talk, the comet keeps coming.

We fear micro-electronics will bring job loss although in much of the industry of the future total numbers may not decline greatly. There may be fewer of the lowest-skilled jobs but more employment of technologists and engineers. But of course these are not the same people. File clerks do not become electrical engineers by a snap of the fingers. A spokesman for America Telephone and Telegraph has said, "AT&T will increase its staff by four percent by 1985, but the mix will be different".

THE CANADIAN COMMUNICATIONS REVOLUTION

Let me briefly review some of the impact already being experienced in the telephone industry in this country.

Although Canada is a semi-industrialized country in many ways, known as a producer of primary products like wheat, lumber, gold, nickel and fish, we have very advanced communications systems. Canada is a world

leader in digital technology, in the use of geostationary satellites, in interactive videotex (Telidon) and in the use of educational television. We are the most heavily-cabled country in the world. More than half the homes in Canada subscribe to cable TV systems. The proportion is higher in such cities as Toronto and is thought to be more than 90% in Vancouver. Canada is fourth in the world for telephones per capita. By the end of 1978 there were 65 telephones for every 100 Canadians, exceeded only by Switzerland (70 of 100), Sweden (73 of 100) and the United States (74 of 100).

TECHNICAL INNOVATION

The telecommunciations industry has been in the forefront of technical change. As we said in 1976 "In the telephone industry, changes in technology are familiar and continuous". That process is still continuing in the industry. Technological change is not a new phenomenon to us. From magneto to battery switchboards, from manual to dial, from toll operators to Direct Distance Dialing and from step-by-step to crossbar, we thought we had seen it all. But there are new techniques threatening our members' job security. Now computerization has enabled the carriers to speed up toll switchboards through TOPS/TSPS, electronic switching is replacing electro-mechanical switching and the combination of miniaturization and computerization is bringing us digital offices which require fewer people to install and which can be maintained by fewer craftspeople.

When the economy was growing and jobs were plentiful, job losses in the telecommunications industry were not considered catastrophic by telephone workers. After all, if you lost your job at the telephone company, you might get a better job at a higher salary somewhere else. But now that

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other jobs are scarce, telephone workers are understandably concerned. Canadian unemployment is at depression levels with well over one million Canadians out of work. The most alarming statistic is the one for workers between 15 and 24 years of age which is almost double the national rate - 14.5% to 8.3%. Management's answer to all problems of reduced workforce is that the lower figure will be reached by "attrition". No present employees will be released but retirees and quits will not be replaced. But there will be no jobs for our sons and daughters, our nephew and nieces. There will be fewer job opportunities for the young. That is tragic for the family and devastating for society.

The greatest impact on telephone employment came with the substitution of dial telephones for manual service. Certainly that period saw the greatest reduction in staff. But it went relatively smoothly because it was forseen well in advance, it happened during times of high employment and a growing economy so that those people displaced readily found other employment, and furthermore union agreements contained cushioning clauses. Direct Distance Dialing caused a further reduction in operators, this time toll-operators.

Further reductions in operator staff are predicted due to further sophistication in the Directory Assistance program. At B.C. Telephone for example, centralizing of Directory Assistance and the use of a computerized information retrieval system will reduce the directory assistance operator positional requirements by 25 percent according to the company's estimate.

Directory Assistance computerization by Bell Canada will cut D.A. operators by 15% in Toronto and Montréal. Average work time per D.A. call falls from 41 seconds on a manual board to 31 seconds on a mechanized board.

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Interactive television which has been made possible by microelectronics, will eliminate telephone directories and information operators completely when it will be possible for a telephone subscriber to instruct his television set to show him the number he seeks. That system, called "Télétel", is already being field-tested in France.

TOPS/TSPS

The new computerized system of individual toll operator positions is known as Traffic Operator Position Systems (TOPS) by Northern Telecom and is in use at SaskTel and Bell Canada. The similar system manufactured by Automatic Electric is known as Traffic Service Position System (TSPS) and has been introduced in B.C. Telephone territory. We have said: "TSPS or TOPS is nothing more nor less than our old enemy the speed-up, aided by computerization".

The first installation in Canada was in Vancouver. By December of 1976 the company was able to claim that: "In Vancouver, the computerized operator switchboard system reduced our positional requirements significantly and has made it possible to provide service with an operating staff 22 percent less than would have been required using previous technology". TSPS was extended to New Westminister in 1978. There was a forty percent reduction in work load there. They expect attrition and transfers will take care of surplus operators. There is no retraining program because of TSPS.

At Bell Canada, the company estimates that there will be a reduction of 35 to 40 percent in necessary operators in offices converted from cord switchboards. There was a loss of 475 operators in Toronto by the end of 1978, 59 in Hamilton by the end of 1979, and 518 fewer in Montréal by the end of 1982. An operator is expected to handle 35 to 40 percent more calls

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at a TOPS position as compared to a cord board. The company is spending up to $25 million per year until 1981 on this program. Training is provided for displaced operators.

Bell Canada figures show the TOPS speed-up: the average work time per call for a person-to-person call on a manual board is 87 seconds; at a TOPS position it is 66 seconds. On collect station calls the time drops from 64 seconds to 31 seconds. 564 manual positions were removed in 1978 and 358 TOPS position installed. In 1979, 332 manual positions were replaced by 259 TOPS positions. In 1980 the figures will be 310 and 121; and in 1981, 286 manual positions will be removed and 168 TOPS positions installed. By 1981, 1492 manual positions will be gone; replaced by 906 TOPS positions.

All these new technologies have reduced traffic staff drastically in recent years. At Bell Canada, the traffic and dining service unit which covered 13,600 employees in 1969 had dropped to 7,401 in 1979. At BC Tel there were 1,321 operators employed in Vancouver and New Westminister in 1974 but only 660 in 1979. In the United States according to a presidential report the total number of telephone operators dropped from 390 thousand to 342 thousand in only three years, from 1974 to 1977.

A report by Automatic Electric Company, which manufactures the TSPS system lists the benefits of their system as:

1) reducing operator work-time by 40% to 60%, and
2) obtaining a very high efficiency in operator utilization, and
3) obtaining better supervision of operators, and
4) better controlling and scheduling of operators, and

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5) recording more precise, detailed and "automated reporting of operator performance".

These "benefits" of course are benefits for management. The result is a speeded-up, more oppressive environment for operators.

OFFICE EMPLOYMENT

In telephone companies a drop in service representatives and general clerical jobs has been offset by gains in marketing and engineering. However, the use of word processors has made file-clerks unnecessary and will speed-up and simplify many typing tasks. This use of computerization has already transformed newspaper production and abolished many highly-skilled printing occupations.

Even highly technical occupations are being computerized.

Computerized drafting is here. The joint utility mapping project begun by BC Hydro, BC Tel and the municipality of Burnaby, completed in 1978, rendered draftspeople redundant. This was the first in North America. It will spread.

The West German Metalworker's Union reports that one small German Foundry employing 150 people replaced two technical college engineering graduates and 15 technical drafters with one MA in Engineering, one terminal and one plotter.

ELECTRONIC SWITCHING

Changing technology in central exchange offices has decreased the number of craft jobs required to maintain the new systems and also decreased jobs in manufacturing and equipment installation. Obviously operating equipment in good working order is not scrapped when new equipment is developed.

The new technology is used in new offices, for extensions or for replacements when the other equipment is finally disposed of. Consequently, a great variety of types of central office equipment are in use simultaneously. For example, Bell Canada at the end of 1975 had 597 step-by-step switching systems in use, 432 crossbar systems, 11 #1ESS (Electronic Switching System) offices and 31 SP-1 (Stored Program) offices.

Whatever other advantages the move to electronic switching brings to the telephone company, a reduction in maintenance man-hours is clear. BC Telephone has declared regarding ECC (Electric Common Control): "The main reason for ECC conversion is to provide improved service capabilities and reduce operating costs. A major element in cost reduction is the cost of labour required, so that the result will be a reduction in labour cost". B.C. Telephone expects savings to balance capital costs by 1980 and then save as much as $34.6 million in 1985. 50% of local customers will be converted to electronic switching by 1980 and 75% by 1985. Bell Canada has been replacing SXS by electronic switching by about 40 thousand lines per year. Studies by P.C. Tel of small SXS offices replaced by ECC machines showed dramatic reductions in maintenance workers per 10 thousand lines. For example: Houston, from 9.40 to 3.75 and Port Hardy, from 11.0 to 1.7. The Japanese telephone union, ZENDENTSU, says that in an office with 20 thousand lines, 5 workers are needed in an electronic office compared to 20 in a comparable Step-By-Step exchange.

DIGITAL TECHNOLOGY

Digital technology is already in use of toll routes and in the SL-1 PBX. About 12 percent of Bell Canada toll trunks are on digital carrier (LD-1, LD-4 or DUV-digits under voice). Digital Multiplex Systems (DMS)

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will cover about 15 percent of Bell exchange and 50 percent of toll trunking by the mid-1980's.

Bell Canada says the emphasis is on digital techniques because of cost savings. A portion of that saving is in reduced labour cost. A DMS-100 (a medium to large machine handling from 6 thousand lines and up) relative to SP-1, is expected to reduce the maintenance effort by 0.4 person/years for every 10 thousand lines. Bell estimates that the maintenance expense per line per year is $13.50 for step-by-step, $9.00 for Crossbar, $6.00 for ESS but only $2.00 for Digital.

The introduction of digital technology has meant a reduction of the work-force in both manufacturing and installation. A Northern Telecom spokesman has said: "the company is reducing its workforce. Causes are the shift to less labour-intensive digital products and reduced telephone expansion". New products are produced by newer more highly automated machines. The new products use more miniature and transistor units which reduce the size of the modules which then can be installed by fewer equipment installers.

INTERCONNECT AND TERMINAL ATTACHMENT

The recent decision by the Canadian Radio-television and Telecommunications Commission to permit the attachment of subscriber provided terminal equipment to the telephone network was a tough blow for telephone workers. In the United States terminal attachment has been permitted and the president of the Communications Workers of America has estimated that 100,000 jobs have disappeared from the industry. The United States Federal Communications Commission has a policy of introducing competition into the telecommunications industry. The famous "Carterphone" decision of 1968 cleared

the way for the marketing of interconnect apparatus. Microwave companies now offer carrier services. There are several corporations offering digital data networks including ITT and Datran. There is a Satellite Business System (SBS), backed by IBM, using links to a satellite through a "dish" on the customer premises. Private value-added networks lease transmission facilities and link them to their own mini-computers. The situation in the United States has been described as: "a competitive free-for-all apparently for the sake of competition, not for the sake of public benefit".

A report to the U.S. President recorded a drop in telephone employees of 130,000 or 15.8% from 1974 to 1977.

The interconnection of cable television and the telephone system will undoubtedly cause great changes in the industry. We foresaw this in 1976 when we stated: "When individual access to computer terminals becomes available and less costly, broad-band services provided by cable television will be more common and various forms of integration and co-operation between CATV and telecommunications will result".

The government paper of 1975, "Towards an Electronic Payments System" envisaged a system of that sort using computers and data transmission. Internationally, the setting-up of SWIFT (Society for Worldwide Banking Financial Telecommunications) in 1973 by 240 European, Canadian and American banks speeded up the international transmission of data. The FITI has pointed out the problem of networks competing with the telephone companies' facilities. SWIFT could be viewed as wasteful duplication to EURONET and other forms of co-operation by international carriers.

TELIDON

Two-way television has arrived. The invention of videotex can enable subscribers to communicate with central information stores using the ordinary television set and the telephone network. The Canadian Department of Communications has devised a new advanced form of videotex, known as Telidon. The data banks can provide printed or graphic information to a television set equipped with a terminal and key pad over the telephone network. Such information could include telephone directory information - ominous news for telephone operators! The telephone companies are actively co-operating in field trials in Toronto, Ontario and in Manitoba.

WHO WILL ADJUST?

Some wise words on this subject have been written by Professor Stephen Peitchinis of the University of Calgary: "An aspect of these changes to which little attention has been focused is the human element: we have accepted them as a natural consequence of technological change, and expected those affected to accommodate to the requirement of the new processes. If geographic mobility is required, workers will be expected to move or lose their jobs; if retraining is required, they will be expected to submit to it or lose their jobs; if relocation within the enterprise is required, they will be expected to relocate at a moment's notice. Seldom has there been any question as to who should accommodate to what - people to technology or technology to people. It has always been taken for granted that the people, in their capacities as workers, consumers and citizens, will adjust to and accommodate to a change in technology regardless of its nature and magnitude". To which we can only add this prediction: the introduction of

new technology in ways which destroy jobs will be resisted vigorously by organized labor. Technological innovations which are perceived by Canadian workers as destructive of job security will be halted in some cases, hampered in other and resisted vigorously everywhere. Ad-hoc introduction of the microelectronics revolution will be combatted in ways that non-unionists might charaterize as "primitive","Luddite", or "feather-bedding". There must be planning or there will be industrial chaos and turmoil.